

What is claimed is

1. A contamination control apparatus comprising:

a sprayer including at least one spray nozzle;

at least one eliminator defining an air flow passageway exposed to said at least one spray nozzle such that air flowing through the passageway will be contacted by spray issuing from said at least one spray nozzle, whereby contaminants are removed from the air; and

a circulator connected to said sprayer so as to provide water to the sprayer that is sprayed into said eliminator by said at least one spray nozzle, said circulator including a pH control device that adjusts the pH of the water provided to the sprayer, and an organic matter removing device that removes organic matter from the water provided to the sprayer.

2. The apparatus of claim 1, wherein the pH control device includes an ion exchanger.

3. The apparatus of claim 1, wherein the organic matter removing device includes an organic resin.

4. The apparatus of claim 1, wherein said circulator further comprises a storage tank connected to said eliminator so as to receive water containing contaminants from the eliminator, and a water supply pipe connected to said storage tank separately from the connection between said storage tank and said eliminator such that additional water other than that in said eliminator can be introduced into the

storage tank.

5. The apparatus of claim 1, wherein the circulator further comprises a sterilizer that sterilizes the water provided to the sprayer.

6. The apparatus of claim 1, wherein the air flow passageway of said at least one eliminator has a bend in it.

7. The apparatus of claim 1, wherein said at least one eliminator comprises at least two eliminators disposed in series.

8. The apparatus of claim 7, further comprising an additional sprayer interposed between the eliminators, the additional sprayer including at least one spray nozzle.

9. The apparatus of claim 1, wherein said at least one eliminator comprises at least two eliminators disposed in parallel.

10. The apparatus of claim 1, further comprising at least one additional water supply nozzle disposed in said eliminator and oriented to spray water into the air passageway of said eliminator along with that provided by said sprayer.

11. In a substrate processing facility having a clean room, an air-conditioning system comprising:

a substrate processing chamber isolated from the clean room;

air supply piping connected to said substrate processing chamber and open to the interior of said clean room so as to introduce primary air from the clean room into the substrate processing chamber;

a contamination control apparatus connected to said air supply piping upstream of said substrate processing chamber so as to receive the primary air from said clean room, the contamination control apparatus including

a sprayer including at least one spray nozzle,

at least one eliminator defining an air flow passageway exposed to said at least one spray nozzle and to said air supply piping such that the primary air will flow through the passageway and will be contacted by spray issuing from said at least one spray nozzle, whereby contaminants are removed from the primary air, and

a circulator connected to said sprayer so as to provide water to the sprayer that is sprayed into said eliminator by said at least one spray nozzle, said circulator including a pH control device that adjusts the pH of the water provided to the sprayer, and an organic matter removing device that removes organic matter from the water provided to the sprayer; and

clean air supply piping connecting the air flow passageway of said eliminator to said processing chamber such that clean air is introduced from said contamination control apparatus to said substrate processing chamber .

12. The air-conditioning system of a substrate processing facility of claim 11, further comprising a clean air control unit that is connected to said clean air supply piping and is operable to regulate at least one of the temperature and humidity of the clean air supplied to said substrate processing chamber.

13. The air-conditioning system of a substrate processing facility of claim 11, further comprising circulation piping connecting said substrate process chamber to said contamination control apparatus at an upstream side of the air passageway of said eliminator such that secondary air in said substrate processing chamber is fed into the contamination control apparatus.

14. The air-conditioning system of a substrate processing facility of claim 11, wherein said circulator further comprises a storage tank connected to said eliminator so as to receive water containing contaminants from the eliminator, and a water supply pipe connected to said storage tank separately from the connection between said storage tank and said eliminator such that additional water other than that in said eliminator can be introduced into the storage tank.

15. The air-conditioning system of a substrate processing facility of claim 11, wherein the air flow passageway of said at least one eliminator has a bend in it.

16. The air-conditioning system of a substrate processing facility of claim 11, wherein said at least one eliminator comprises at least two eliminators disposed in series.

17 The air-conditioning system of a substrate processing facility of claim 16, further comprising an additional sprayer interposed between the eliminators, the additional sprayer including at least one spray nozzle.

18. The air-conditioning system of a substrate processing facility of claim

11, wherein said at least one eliminator comprises at least two eliminators disposed in parallel.

19. The air-conditioning system of a substrate processing facility of claim 11, further comprising at least one additional water supply nozzle disposed in said eliminator and oriented to spray water into the air passageway of said eliminator along with that provided by said sprayer.

20. A substrate processing facility comprising:

a clean room;

a plurality of substrate processing apparatuses disposed in said clean room, each of said apparatuses having a respective chamber in which substrates are processed;

an external air-conditioning system having a contamination control apparatus disposed outside said clean room, the contamination control apparatus including

a sprayer including at least one spray nozzle,

at least one eliminator defining an air flow passageway exposed to said at least one spray nozzle such that the primary flow through the passageway will be contacted by spray issuing from said at least one spray nozzle, whereby contaminants are removed from the primary air, and

a circulator connected to said sprayer so as to provide water to the sprayer that is sprayed into said eliminator by said at least one spray nozzle, said circulator including a pH control device that adjusts the pH of the water provided to the sprayer, and an organic matter removing device that removes organic matter from the water provided to the sprayer,

a clean air supply duct leading from said contamination control apparatus at a downstream side of said eliminator into said clean room and connected to the chambers of said substrate processing apparatuses so that air cleaned by said contamination control apparatus is supplied to said substrate processing apparatuses; and

a filter disposed in said duct so as to filter the clean air flowing from said contamination control apparatus to said substrate processing apparatuses.

21. The substrate processing facility of claim 20, further comprising a clean air control unit that is connected to said clean air supply duct and is operable to regulate at least one of the temperature and humidity of the clean air supplied to said substrate processing apparatuses.

22. The substrate processing facility of claim 20, further comprising a plurality of air supply pipes connected to the substrate processing apparatuses and open to the interior of said clean room so as to introduce air in the clean room into the processing chambers.

23. The substrate processing facility of claim 20, wherein said circulator further comprises a storage tank connected to said eliminator so as to receive water containing contaminants from the eliminator, and a water supply pipe connected to said storage tank separately from the connection between said storage tank and said eliminator such that additional water other than that in said eliminator can be introduced into the storage tank.

24. The substrate processing facility of claim 20, wherein the air flow passageway of said at least one eliminator has a bend in it.

25. The substrate processing facility of claim 20, wherein said at least one eliminator comprises at least two eliminators disposed in series.

26. The substrate processing facility of claim 25, further comprising an additional sprayer interposed between the eliminators, the additional sprayer including at least one spray nozzle.

27. The substrate processing facility of claim 20, wherein said at least one eliminator comprises at least two eliminators disposed in parallel.

28. The substrate processing facility of claim 20, further comprising at least one additional water supply nozzle disposed in said eliminator and oriented to spray water into the air passageway of said eliminator along with that provided by said sprayer.

29. A method of conditioning air used in the processing of a substrate within a designated space, said method comprising:

directing primary air from outside the processing chamber, and containing potential contaminants with respect to the processing of a substrate, into a passageway to create a flow of the air in the passageway;

feeding water to at least one spray nozzle and spraying the flow of air with the water from the at least one spray nozzle, whereby the water absorbs contaminants in

the air;

measuring the pH of the water before it is fed to the at least one spray nozzle;

adjusting the pH of the water if the measured pH is outside a set range;

treating the water, before it is fed to the at least one spray nozzle, to remove organic matter from the water before it is sprayed onto the flow of air; and

directing the air, once it has been sprayed with the water from the at least one spray nozzle, into a substrate processing chamber sealed from the environment external to the chamber.

30. The method of claim 29, further comprising collecting in a storage tank the water that has been sprayed onto the flow of air, wherein said feeding of the water to the at least one spray nozzle includes circulating the water from the storage tank back to the at least one spray nozzle, and introducing additional water into the storage tank separately from that which is collected in the tank after having been sprayed onto the flow of air.

31. The method of claim 30, wherein said introducing additional water into the storage tank comprises introducing an amount of water that is equal to 10% of that being collected in the tank after having been sprayed onto the flow of air.

32. The method of claim 30, further comprising sterilizing the water fed from the storage tank to the at least one spray nozzle.

33. The method of claim 29, wherein the creating a flow of air in the passageway comprises inducing a vortex in the air such that the air swirls in the



passageway as it is sprayed with water from the at least one spray nozzle.

34. The method of claim 29, further comprising directing secondary air from the processing chamber into the passageway along with the primary air containing the potential contaminants, whereby both the primary and secondary air is sprayed with water from the at least one spray nozzle.

35. The method of claim 34, wherein the substrate is coated with a resist in the processing chamber, and wherein said directing of secondary air comprises directing into the passageway an amount of the secondary air that constitutes only about 40% of the total volume of the primary and secondary air that is directed into the passageway.

36. The method of claim 34, wherein the process chamber is disposed within a clean room, and wherein the primary air directed into the passageway is drawn from outside the clean room, and the secondary air directed into the passageway is drawn from within the clean room, and the ratio of the volume of the secondary air directed into the passageway to that of the primary air directed into the passageway is between about 8:2 to 9:1.

37. The method of claim 29, further comprising measuring at least one of the temperature and moisture content of the air once it has been sprayed with water, and adjusting the at least one of the temperature and moisture content of the air if the at least one of the temperature and moisture content of the air is outside a set range.

38. The method of claim 29, wherein said spraying the flow of air with the

water from the at least one spray nozzle comprises spraying the flow of air with water having a hexagonal molecular structure.